

Coupled Multiscale Analysis of Bio and Nano–Mechanical Systems

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LECTURE: 9:00 AM - 10:00 AM

ENGINEERING CENTER
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Abstract:

Development of multiscale mathematical frameworks and simulation strategies for processes occurring at different length and time scales are necessary for the estimation of mechanical properties of complex bio- and nano- systems. In this talk, recent advances in the mechano-biological computational models to analyze the effect of micro-structural constituents on the mechanical behavior of biological soft tissues would be discussed. These novel computational formulations are developed for understanding and providing directives for enhancing the efficiency of clinical diagnostic tools. In the second part of this talk, multiscale thermo-mechanically coupled computational models for the analysis of nano-materials used in applications involving high-strength nano-composites for advanced aerospace or mechanical engineering systems would be discussed.

Biography

Dr. Unnikrishnan is an Assistant Professor in Aerospace Engineering and Mechanics at the University of Alabama. He received his Ph.D. in Civil Engineering from Texas A&M University in 2007. Dr. Unnikrishnan has a broad background in solid mechanics and mechanics of materials, with specific expertise in the multiscale (from atomistic to macroscale) computational analysis of nano- and bio- materials and advanced composites. His primary research interests are to study and understand the behavior of complex bio- and nano- systems using appropriate physics-based modeling methodologies.

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